lowed for 20 minutes, following which the vessel were again isolated, removed from the body, gently rinsed, fixed, and prepared for light microscopic histological analysis. Using the naked eye, the crushed segments in control animals, which lacked illumination, were red, indicating internal thrombus with entrapped red blood cells. By contrast, no redness was observed at the site of the crush injury in the treated vessels. Histology showed extensive thrombus, fibrin, and entrapped red blood cells in the non-treated vessels. By contrast, no thrombus or fibrin or entrapped red blood cells were observed in the treated vessels. The procedure was conducted in four control animals and three treated animals.

This example demonstrates that the polymerization can be carried out in situ in the living animal, that the polymer coating remains adherent to the vessel wall during arterial blood flow, and that the polymer coating can prevent thrombosis in vivo in non-anticoagulated animals. This approach to treatment has clear benefits in preventing abrupt reclosure, vasospasm, and restenosis after intravascular interventional procedures. Moreover, it is more generally applicable to other intraluminal and open-surface organs to be treated.

Modifications and variations of the present invention, the macromer and polymeric compositions and methods of use thereof, will be obvious to those skilled in the art from the foregoing detailed description. Such modifications and variations are intended to come within the scope of the appended claims.

We claim:

1. A biodegradable, polymerizable macromer having a solubility of at least about 1 g/100 ml in an aqueous solution comprising at least one water soluble region, at least one degradable region which is hydrolyzable under in vivo conditions, and free radical polymerizable end groups having the capacity to form additional covalent bonds resulting in macromer interlinking, wherein the polymerizable end groups are separated from each other by at least one degradable region.

2. The macromer of claim **1** wherein the water soluble region is attached to a degradable region, at least one polymerizable end group is attached to the water soluble region, and at least one polymerizable end group is attached to the degradable region.

3. The macromer of claim **1** wherein the water soluble region forms a central core, at least two degradable regions are attached to the core, and the polymerizable end groups are attached to the degradable regions.

4. The macromer of claim **2** wherein the degradable region is a central core, at least two water soluble regions are attached to the core, and a polymerizable end group is attached to each water soluble region.

5. The macromer of claim **1** wherein the water soluble region is a macromer backbone, the degradable region is a branch or graft attached to the macromer backbone, and polymerizable end groups are attached to the degradable regions.

6. The macromer of claim **1** wherein the degradable region is a macromer backbone, the water soluble region is a branch or graft attached to the degradable backbone, and polymerizable end groups are attached to the water soluble branches or grafts.

7. The macromer of claim **1** wherein the water soluble region is a star backbone, the degradable region is a branch or graft attached to the water soluble star backbone, and at least two polymerizable end groups are attached to a degradable branch or graft.

8. The macromer of claim **1** wherein the degradable region is a star backbone, the water soluble region is a branch or graft attached to the degradable star backbone, and two or more polymerizable end groups are attached to the water soluble branch or graft.

9. The macromer of claim **1** wherein the water soluble region is also the degradable region.

10. The macromer of claim **1** wherein the water soluble region is also the degradable region, one or more additional degradable regions are grafts or branches upon the water soluble region.

11. The macromer of claim **1** comprising a water soluble core region, at least two degradable extensions on the core, and an end cap on at least two of the degradable extensions, wherein

the core comprises poly(ethylene glycol);

each extension comprises biodegradable poly(α-hydroxy acid); and

each end cap comprises an acrylate oligomer or monomer.

12. The macromer of claim **11** wherein

each extension comprises biodegradable poly(hydroxy acid); and

each end cap comprises an acrylate oligomer or monomer.

13. The macromer of claim **12** wherein the poly(ethylene glycol) has a molecular weight between about 400 and 30,000 Da;

the poly(hydroxy acid) oligomers have a molecular weight between about 200 and 1200 Da; and

the acrylate oligomer or monomer have a molecular weight between about 50 and 200 Da.

14. The macromer of claim **1** wherein the polymerizable end groups contain a carbon-carbon double bond capable of cross-linking and polymerizing macromers.

15. The macromer of claim **1** wherein crosslinking and polymerization of the macromer can be initiated by a light-sensitive free-radical polymerization initiator with or without a cocatalyst, further comprising a free radical polymerization initiator.

16. The macromer of claim **15** wherein the initiator is selected from the group consisting of xanthine dyes, acridine dyes, thiazine dyes, phenazine dyes, camphorquinone dyes, and acetophenone dyes.

17. The macromer of claim **16** wherein the initiator is selected from the group consisting of an eosin dye with triethanolamine, 2,2-dimethyl-2-phenyl acetophenone, and 2-methoxy-2-phenyl acetophenone.

18. The macromer of claim **1** wherein crosslinking or polymerizations can be initiated in situ by light having a wavelength of 320 nm or longer.

19. The macromer of claim **1** wherein the degradable region is selected from the group consisting of poly (hydroxy acids), poly(lactones), poly(amino acids), poly(anhydrides), poly(orthoesters), poly(phosphazines), and poly(phosphoesters).

20. The macromer of claim **19** wherein the degradable region is a poly(α-hydroxy acid) selected from the group consisting of poly(glycolic acid), poly(DL-lactic acid) and poly(L-lactic acid).

21. The macromer of claim **19** wherein the poly(lactone) is selected from the group consisting of poly(ϵ-caprolactone), poly (δ-valerolactone) or poly(λ-butyrolactone).

22. The macromer of claim **1** wherein the water soluble region is selected from the group consisting of poly-(ethylene glycol), poly(ethylene oxide), poly(vinyl alcohol), poly(vinylpyrrolidone), poly(ethyloxazoline),